**Ihtisham ul Haq**[1]**, Shujin Zhu**[2]
# DOES FDI COMPLEMENT DOMESTIC INVESTMENT? A COMPARATIVE STUDY OF INDIA AND PAKISTAN

*Time series analysis of co-integration and error correction model are applied to explore the nexus between FDI and domestic investment in India and Pakistan. The results assert that FDI has complementary effect on domestic investment in India whereas it has the substituted effect on domestic investment in Pakistan in the long run. The complementary effect in India is elastic as compared to substitution effect of FDI in Pakistan, which is inelastic.*
*Keywords: FDI; economic growth; domestic investment; India; Pakistan.*
*JEL classification: E22; F21; 040; C32.*

**Іхтішам уль Хак, Шуджін Жу**
# ЧИ ДОПОВНЮЄ ЗОВНІШНЄ ІНВЕСТУВАННЯ ВНУТРІШНЄ? ПОРІВНЯЛЬНЕ ДОСЛІДЖЕННЯ ІНДІЇ ТА ПАКИСТАНУ

*У статті аналіз часових рядів та модель корекції помилок застосовано для дослідження взаємозв'язку між прямим іноземним інвестуванням та внутрішніми інвестиціями у випадку Індії та Пакистану. Результати аналізу вказують на те, що для Індії ПІІ мають доповнюючий ефект відносно національного інвестування, в той час як для Пакистану ПІІ навпаки — виштовхують внутрішнє інвестування. При цьому, доповнюючий ефект в Індії є доволі еластичним, а виштовхуючий ефект у Пакистані — нееластичним.*
*Ключові слова: ПІІ; економічне зростання; внутрішнє інвестування; Індія; Пакистан.*
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**Ихтишам уль Хак, Шуджин Жу**
# ДОПОЛНЯЕТ ЛИ ВНЕШНЕЕ ИНВЕСТИРОВАНИЕ ВНУТРЕННЕЕ? СРАВНИТЕЛЬНОЕ ИССЛЕДОВАНИЕ ИНДИИ И ПАКИСТАНА

*В статье анализ временных рядов и модель коррекции ошибок применены для исследования взаимосвязи между прямым иностранным инвестированием и внутренними инвестициями в случае Индии и Пакистана. Результаты анализа указывают, что для Индии ПИИ имеют дополняющий эффект по отношению к национальному инвестированию, в то время как в Пакистане ПИИ наоборот — вымещают внутреннее инвестирование. При этом, дополняющий эффект в Индии довольно эластичен, а вымещающий эффект в Пакистане — неэластичен.*
*Ключевые слова: ПИИ; экономический рост; внутреннее инвестирование; Индия; Пакистан.*

**Introduction.** The importance of foreign direct investment (FDI) has significantly increased globally since the 1980s. The considerable growth in FDI volumes has moved up concerns about its impact on economic development in the case of developed economies. However, little or no consideration has been given to such effects in developing economies (Al-Sadig, 2013). Flows of FDI to developing economies and growing power of multinational firms in these economies have given rise to some very important queries about the developmental impact of FDI in host countries. That is, are the recipients actually being benefited from allotting their

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domestic resources to multinational firms; is FDI adopted as a developmental policy really promotes development in developing economies (Acar et al., 2003). One of the key ways through which this impact of FDI inflows could be applied on host economies is domestic investment (Ndikumana and Verick, 2008).

This dilemma makes the effects of FDI on recipient country extremely tentative that FDI inflows either crowd in or crowd out domestic investment. The effect of FDI inflows on host country's domestic investment is largely determined by underlying domestic investment environment and traditional domestic trade regime. FDI inflows will negatively affect domestic investment if the traditional trade regime is profoundly protecting domestic investors and domestic firms are not efficient enough and technologically advanced to compete with foreign firms. However, FDI inflows can enhance domestic investment through transmission of modern technologies and forward or backward production linkages (Acar et al., 2003).

The effect of FDI inflows on domestic investment is verified by determining its influence on gross fixed capital formation. Gross fixed capital formation consists of foreign and domestic investments in physical capital. If one unit increase in FDI inflows causes the increase in gross fixed capital formation by one unit then this represents a neutral influence of FDI on domestic investment. Similarly, one unit increase in FDI inflows increase gross fixed capital formation by more than one unit then this leads to crowding-in effect by fueling domestic investment. The possibility of crowding-out effect arises if a less than one unit increase in gross fixed capital formation occurs as a result of one unit increase in FDI inflows (Agosin and Machado, 2005).

Crowding in effect comes through either forward, or backward linkages. Forward linkages are formed with provision of inputs by foreign corporations to local ones that lead to increased efficiency of local firms, where the supply of inputs by domestic firms to foreign corporations forms backward linkages. Conversely, FDI can crowd out domestic investment if domestic firms are less competitive than foreign ones in terms of access to international markets, technical knowledge and overall efficiency. Also there exist monopolistic or oligopolistic tendencies by foreign firms to exploit the domestic situation, probably by charging less than domestic prices. Additionally, local skilled labor can also be taken away from domestic firms by foreign firms (Gallagher and Zarsky, 2007).

A glance on empirical literature makes this evident that there is no conclusive direction when it comes to the FDI-domestic investment nexus. This clearly recommends and demonstrates the importance of country/region specific studies in this regard. Determining the nature of influence of FDI inflows on domestic investment leads us to inconclusive direction as results vary from case to case. Thus, it is important to evaluate developmental policies using FDI inflows as a tool with reference to a particular developing country.

This study examined the impact of FDI on domestic investments in India and Pakistan. This is the first attempt to explore FDI-domestic investment nexus for these developing economies with economic growth and real rate of interest as control variables in time series analysis. The former control variable was taken into account in the study to capture the economic performance while the later one — to capture the role of monetary policy. The long-run relationship between the variables was found

through the co-integration technique. Besides this, the long-run estimates were obtained through vector error correction mechanism while other time series studies for these economies restricted itself to causality analysis. These results postulated that the effect of FDI on domestic investment is complementary with domestic investment in India and the opposite case, crowding out effect is explored in Pakistan. This study adds to the existing literature on domestic investment and FDI relationship and demonstrated that the influence of FDI on domestic investment is country specific.

The rest of the paper is arranged in the following order. The next part is about literature review. The policy regarding FDI in India and Pakistan is presented in the third part. The fourth part runs about data, the empirical model and research methodology. The results, findings and discussions are presented in the fifth part, while the last part concludes the paper.

**Literature review.** Empirical literature gives us no conclusive evidence on the nature of relationship between FDI and domestic investment. This imprecision in the results asserts that the impact of FDI on domestic investment is determined by national/regional policies, business environment and methodology adopted for the analysis. Therefore these inconclusive findings support and propose country or regional specific studies (Eregha, 2011).

J. Misun and V. Tomsik (2002) uncovered a crowding-out effect in Poland and a crowding-in effect in Czech Republic and Hungary during the 1990s. Empirical studies like D.D. Kim and J. Seo (2003); S, Arndt et al. (2007); and S. Tang et al. (2008) posited that FDI complements domestic investment. On the other hand, studies like A.E. Harrison and M.S. McMillan (2006); M. Wang (2010); O. Morrissey and M. Udomkerdmongkol (2012) concluded that FDI substitutes domestic investment.

R.M. Agosin and R. Machado (2005) found that FDI has a substituting effect on domestic investment in case of Latin America and a neutral influence in case of Asia and Africa. Similarly, H.L. Lin and W.B. Chuang (2007) examined the effect of FDI on domestic firms in Taiwan. They found that FDI has crowding out effect on small domestic firms and crowding in effect for big domestic firms. B.B. Saglam and A.Y. Yalta (2011) carried out time series study for Turkey to determine the association of FDI with private and public investments. Their results navigated the long run relationship of FDI with private and public investment, thus raising the question on FDI contribution in economic growth in Turkey.

**The Indo-Pak policy regarding FDI.**

*1. FDI policy of India.* Indian economy holds the distinguishing attributes like huge number of skilled managerial and technical expertise to make itself a preferred destination for FDI. Its strength lies in information technology besides other significant areas such as apparels, chemicals, jewelry, pharmaceuticals, and auto components. India represents a growing consumer market as its middle class population stands at 50 mln.

The Government of India and the Department of Industrial Policy and Promotion, Ministry of Commerce and Industry announces FDI policy that is notified by the Reserve Bank of India as amendments to the Foreign Exchange Management Regulations (FEMA), 2000. There are some sectors not opened to FDI. These sectors include construction of farm houses, cigarettes and cigarillos, cigars, and retail trading except single brand retailing. Similarly, investment in atom-

ic energy and railway is not opened to private business. Activities related to lottery, gambling and betting is prohibited for foreign investments.

The restrictive and rigid policy regarding FDI hindered foreign investment in India in the past. However, economy's deregulation and India's liberalizing FDI policy of 2005 is attracting foreign investments now. Similarly, industrial policy reforms eased the restrictions and facilitated access to foreign technologies and investments. The amendments made to FDI policy in March, 2005 allow 100% foreign investment in the construction sector. This sector includes housing and townships, hotels and resorts, hospitals and educational institutions, regional level infrastructure.

India is the largest, by GDP, population and area, member of the South Asia Association for Regional Cooperation (SAARC) that comprises 8 countries of South Asia. The comparison scenario of FDI inflows to SAARC and India is presented in Figure 1. FDI inflows got momentum after Indian government opened its economy to the rest of world in early 1990s. Less FDI has been attracted by India in the 1990s as compared to FDI inflows since 2000. However, FDI gets the momentum after amendments were made to FDI policy in March, 2005. Like the size of India in the region, the share of FDI inflows to India is also huge.
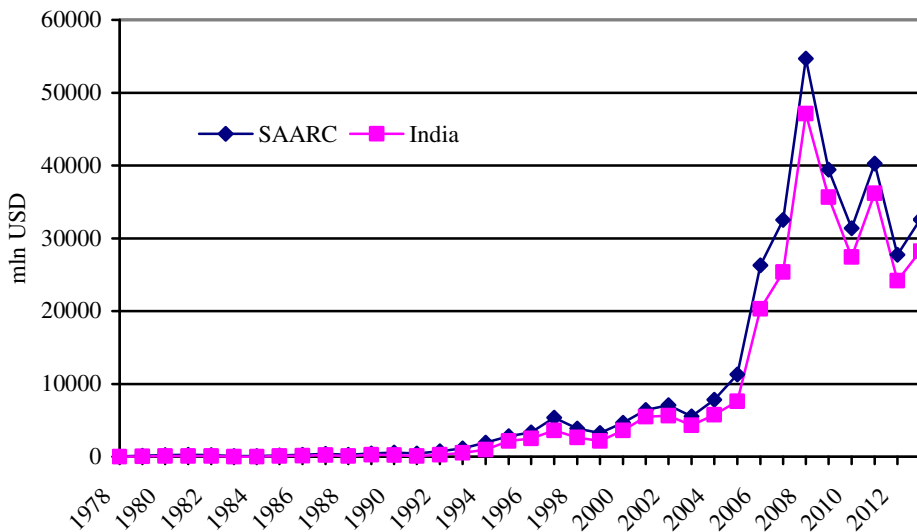


*Figure 1.* **FDI inflows to India and SAARC** (UNCTAD's statistical database)

**2. FDI policy of Pakistan.** FDI in Pakistan is protected from expropriation by 1976 Foreign Private Investment Promotion and Protection Act, and 1992 Economic Reforms Act is the primary legal safeguard for the rights of foreign investors. The state bank of Pakistan (SBP) is responsible for supervising the banking sector while the security and exchange commission of Pakistan (SECP) oversees the insurance industry in Pakistan as part of financial reforms. The government offers incentives in forms of tax exemption, lower tariffs and improving infrastructure to attract FDI. The government does not discriminate on the basis of ownership as foreign firms are treated equally to domestic ones. However, there are sensitive sectors which are not open to foreign firms like defense and broadcasting.

The raw material and machinery for agriculture and agro-based industries are exempted from import duty. Similarly, import duty is exempted for raw materials for exporting industries. The information technology, housing, construction and tourism sectors are entitled to industry status, which makes these sectors eligible for lower taxes than commercial sector (banking, insurance). In manufacturing no minimum equity investment or national ownership is required. Besides, the government permits a 50% first-year depreciation allowance for all fixed assets. The government also provided the tax-exempt provision to remittances of profits and dividends.

Pakistan received a significant amount of FDI between 2002 and 2007; however, elimination of some tax incentives in 2007 and insurgency situation in the country hindered FDI inflows. FDI inflows hit their minimum, since 2004, in 2012 when fierce protests in major cities against an inflammatory film targeted foreign embassies and foreign companies. Besides this, energy crisis, sectarian violence, and terrorist attacks are the reasons for low FDI inflows in the recent years. FDI inflows are depicted in Figure 2. It can be observed that FDI inflows hit its peak and minimum in 2007 and 2012 respectively since 2004, the year in which Pakistan for the first time in its history crossed the 1 bln USD mark.
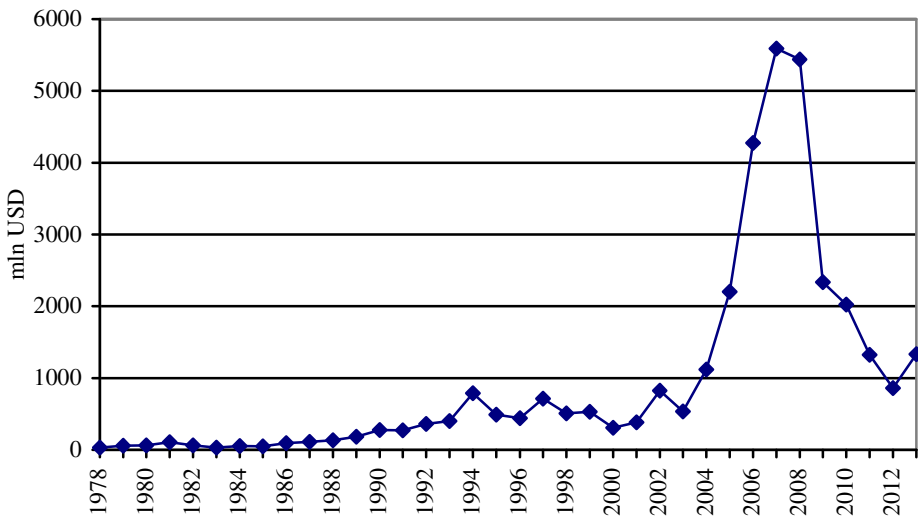


*Figure 2.* **FDI inflows to Pakistan** (UNCTAD's statistical database)

The ratio of FDI to gross domestic product (GDP) for both countries is depicted in Figure 3. This ratio is higher for Pakistan than for India till mid-1990s representing more open policies of Pakistan. The government of Pakistan started privatization of state enterprises in 1992 along with financial reforms. This attracted more FDI to the country. The ratio reached its highest mark in 2007 and since then, due to worsening of socioeconomic and security conditions in the country, it began decreasing.

**Data and research methodology.** This is a comparative study of India and Pakistan regarding the impact of FDI on gross domestic investment (GDI). It has to be tested whether FDI has complementary or substitution effect in these neighboring developing economies. Economic growth and real interest rate are the control variables in the analysis. This study covers the period from 1990 to 2013 for both

economies. The data on ratio of domestic investment (GDI) to GDP, FDI to GDP, real annual economic growth rate (GDP) and real interest rate (RIR) were taken from the World Development Indicators, World Bank; however, the RIR for Pakistan has been collected from various issues of Pakistan Economic Survey.
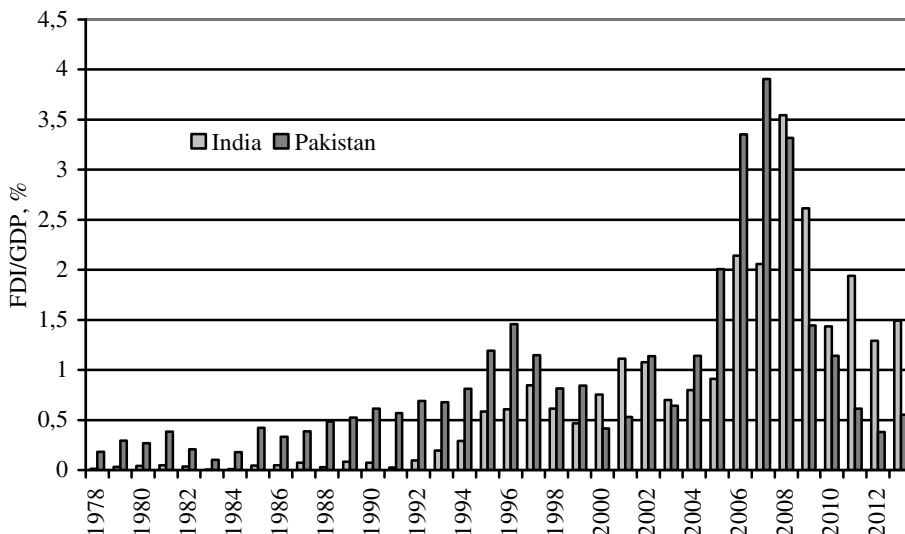


*Figure 3.* **Ratio of FDI to GDP in India and Pakistan** (World Bank)

This study followed R.M. Agosin and R. Mayers (2000) and J. Misun and V. Tomsik (2002) to determine the effect of FDI on domestic investment in the Indo-Pak context. Thus, the model identified for this study would be:

$$GDI_t = \beta_0 + \beta_1 FDI_t + \beta_2 GDP_t + \beta_3 RIR_t + \varepsilon_t, \tag{1}$$

The sign of $\beta_1$ might be positive or negative as it depends on whether FDI complements or substitutes domestic investments. The coefficient $\beta_2$ has to be positive as economic growth posits positive effect on domestic investments. The effect of interest rate is negative according to economic theory, so $\beta_3$ will be turned negative and $\varepsilon$ is the disturbance term.

Usually time series data are trended and non-stationary. If variables at level are analyzed, it could lead to spurious regressions. Differencing is a technique which can make variables stationary but may be losing long-run association between variables. The Johansen maximum likelihood approach is a technique which takes variables at first difference without losing the long-run association. The variables should be integrated of the same order for this technique. After long-run association, it is necessary to know short-run and long-run causality. The vector error correction model (VECM) provides both short-run and long-run causality whereas long-run relation works as restriction imposed in VECM. The number of equations equal to the number of variables as every variable works as endogenous and taken on their first difference in VECM. The difference of the dependent variable depends on its own lags, lags of explanatory variables, error correction term (ECT) and the disturbance term. The equations developed for this study are:

$$\Delta GDI_t = \alpha_1 + \sum_{i=1}^{q} \beta_{1i}\Delta GDI_{t-i} + \sum_{i=1}^{r} \beta_{1i}\Delta FDI_{t-i} +$$
$$+ \sum_{i=1}^{s} \beta_{1i}\Delta GDP_{t-i} + \sum_{i=1}^{p} \beta_{1i}\Delta RIR_{t-i} + \gamma_1 ECT_{t-1} + \mu_{1t}; \tag{2}$$

$$\Delta FDI_t = \alpha_2 + \sum_{i=1}^{q} \beta_{2i}\Delta FDI_{t-i} + \sum_{i=1}^{r} \beta_{2i}\Delta GDI_{t-i} +$$
$$+ \sum_{i=1}^{s} \beta_{2i}\Delta GDP_{t-i} + \sum_{i=1}^{p} \beta_{1i}\Delta RIR_{t-i} + \gamma_2 ECT_{t-1} + \mu_{2t}; \tag{3}$$

$$\Delta GDP_t = \alpha_3 + \sum_{i=1}^{q} \beta_{3i}\Delta GDP_{t-i} + \sum_{i=1}^{r} \beta_{3i}\Delta GDI_{t-i} +$$
$$+ \sum_{i=1}^{s} \beta_{3i}\Delta FDI_{t-i} + \sum_{i=1}^{p} \beta_{3i}\Delta RIR_{t-i} + \gamma_3 ECT_{t-1} + \mu_{3t}; \tag{4}$$

$$\Delta RIR_t = \alpha_4 + \sum_{i=1}^{q} \beta_{4i}\Delta RIR_{t-i} + \sum_{i=1}^{r} \beta_{4i}\Delta GDI_{t-i} +$$
$$+ \sum_{i=1}^{s} \beta_{4i}\Delta FDI_{t-i} + \sum_{i=1}^{p} \beta_{4i}\Delta RIR_{t-i} + \gamma_4 ECT_{t-1} + \mu_{4t}, \tag{5}$$

where as $\Delta$ and $\mu$ is the difference operator and error disturbance term respectively. If the sign of $\gamma$ the coefficient of ECT is negative and significant, it proves that the model is in equilibrium and its magnitude will determine how much the model adjusted itself from external shock. The variables in VECM are stationary so one can apply the least square and can perform diagnostic tests. Causality can be determined in the following three ways in VECM:

The joint significance of the lagged terms of each variable on the right side in each equation is short-run causality running from this variable to the dependent variable in the respective equations. This joint significance of the lagged terms is verified through F-test if more than one lag for each variable is involved.

Long-run causality has to be tested through t-test for the coefficient of error correction term in each of the VECM equations. Testing the joint significance of the error correction term and the lagged terms of various variables on the right side in each equation through Wald or F-test gives the joint significance of the two sources of causality. This is also sometimes mentioned as a measure of "strong Granger causality" (Oh and Lee, 2004).

**Results and discussion.**

*1. Results of unit root tests.* The problem of non-stationarity was identified through Augmented Dickey-Fuller (ADF) test. All the variables for both economies were found to be non-stationary at level. The first difference of the variables showed they became stationary and the order of integration was identified as one. The results are given in Table 1.

*2. Result of the long run relationship test.* The ADF test verified that all the study variables shared the same order of integration and none of them is integrated of high order than one. Then the long-run relation between the variables could be determined through Johansen cointegration test. The results of this test are given in

Table 2. The trace statistics and maximum eigen statistics confirmed three co-integration vectors for India against one co-integration for Pakistan. Thus long-run relationship exists between the variables for both India and Pakistan.

*Table 1.* **Unit root tests,** *authors'*

| Variable | India | | Pakistan | | Order of integration |
| | ADF | | ADF | | |
| | Level | First difference | Level | First difference | |
|---|---|---|---|---|---|
| GDI | 0.165 | -5.211** | -0.946 | -4.520** | I (1) |
| FDI | -0.643 | -5.466** | -1.335 | -3.084** | I (1) |
| GDP | -1.037 | -7.182** | -0.969 | -3.232** | I (1) |
| RIR | -0.640 | -7.792** | -2.727 | -4.399** | I (1) |

Note: The regression equation does not include both intercept and trend either at level or first difference and ** shows the rejection of null hypothesis (non-stationarity) at the 1% level of significance.

*Table 2.* **Johansen co-integration tests,** *authors'*

| Rank r | India | | Pakistan | |
| | Trace statistics | Maximum eigenvalue | Trace statistics | Maximum eigenvalue |
|---|---|---|---|---|
| $r_0 = 0$ | 63.52* | 48.28* | 62.486* | 47.86* |
| $r_0 \leq 1$ | 35.24* | 37.06* | 24.509 | 29.797 |
| $r_0 \leq 2$ | 18.18* | 17.02* | 9.9653 | 15.495 |
| $r_0 \leq 3$ | 2.163 | 2.1628 | 2.3970 | 3.8414 |

Note: * represents the rejection of no co-integration at the 5% level of significance.

*3. Long run estimates.* Long-run estimates based on Johansen cointegration test for India and Pakistan are presented in Table 3. The coefficients of the regressors have the expected sign in the case of India. The coefficient of FDI is significant and positive and larger than one indicating the crowding-in effect. Thus, FDI had complemented GDI in the studied period in India. This result proved the notion that Indian domestic firms can compete with foreign firms. Another argument in favor of this result is that foreign firms created forward as well as backward linkages for domestic firms. It might be concluded that either foreign investment created the demand for domestic investment or provided the flat form in the form of skill workers and technology. Above all, it could be deduced that FDI overcomes capital shortages in India. This result is similar to S. Tang et al. (2008) who found the positive effect of FDI on domestic investments for China.

Similarly, economic growth had also positive and significant effect on GDI showing that GDP growth encouraged GDI. The negative and significant coefficient of RIR discouraged GDI as postulated in the economic theory that there is inverse relationship between interest rate and investment.

The coefficient of FDI is negative and significant in the case of Pakistan. FDI substituted GDI in the case of Pakistan; therefore, this can be referred to crowding-out effect of FDI. J. Misun and V. Tomsik (2002) uncovered a crowding out effect in Poland and this result is also similar to the findings of K.R. Gallagher and L. Zarsky (2007). The reason for this negative effect of FDI is manifold. First, when FDI enter sectors formerly dominated by state-owned enterprises, it crowd out domestic invest-

ment (Mileva, 2008), which is reasonably relevant in the case of Pakistan. It might be concluded that domestic entrepreneurs are lacking the ability to compete with foreigner entrepreneurs on different grounds like the access to capital resources, technological advancement, R&D, quality and advertisement. The third point that might explain this scenario would be more openness of Pakistan's economy for FDI encouragement without considering the protection of the domestic industry by the government. Lastly, FDI might be attracted in those sectors which do not complement domestic investments rather substituted it.

*Table 3.* **Long-run estimates,** *authors'*

| Dependent Variable: GDI | | | | |
|---|---|---|---|---|
| **Regressors** | **India** | | **Pakistan** | |
| | **Coefficients** | **t-values** | **Coefficients** | **t-values** |
| FDI | 4.049 | 3.93*** | -0.971 | 5.44*** |
| GDP | 2.385 | 4.382*** | 0.366 | 7.65*** |
| RIR | -1.862 | 3.929*** | -0.182 | -3.461*** |

Note: *** indicates the significance of the coefficients at 1%.

Economic growth encouraged domestic investment, it has positive and significant effect on domestic investment. It may be deduced that economic performance posited the green signal to domestic investors and they would reap its fruit in terms of high profit. The coefficient of RIR is negative and significant. This again like in the case of India predicted the theoretical relationship between interest rate and investment.

**4. Results of error correction mechanism (ECM).** The next step in the Johansen co-integration analysis is to determine the short-run dynamics through ECM. The results for the ECM co-integration are presented in Table 4. The results for India shown there is a significant positive effect of FDI and economic growth on GDI in the short run. The interest rate impact on GDI turns out to be insignificant. The negative and significant coefficient of ECM posited that the model of GDI is in equilibrium and corrected itself of about 86% from external shock per annum. The model is also relative of good fit as the value of R-squared suggests.

The results for Pakistan are shown in the right part of Table 4. FDI is the only variable among other explanatory variables that has positive short-run effect on GDI. These results show that ups and down in the economic activity in the short run did not effected domestic investment. Similarly, it suggested that the monetary policy remained ineffective to alter the domestic investment in the short run. The model is in equilibrium in the long-run as the coefficient of ECM is significant with negative sign. This ECM value suggested that the model made the self-correction of about 104% annually from external shock. Furthermore, the model for both countries is free from econometric problems. The diagnostic results are provided in Table 5. The model is not suffering from serial correlation and heteroskedasticity. The model also passed the normality test.

**5. Causality based on VECM.** The next step, after determining short- and long-run relationships, is to investigate the direction of causality between the studied variables. Causality results are given in Table 6 for India. This Table had three parts illustrating short-run effects, long-run effects and joint short- and long-run effects respectively.

*Table 4.* **Results of ECM,** *authors'*

| Regressors | India | | Pakistan | |
|---|---|---|---|---|
| | Coefficient | t-value | Coefficient | t-value |
| ΔFDI | 2.237 | 2.132 | 0.6932 | 2.0019 |
| ΔGDP | 0.591 | 2.799 | -0.0245 | -0.2593 |
| ΔRIR | -0.038 | -0.184 | 0.0223 | 0.5208 |
| ΔGDI (-1) | 0.0977 | 0.107 | 0.3193 | 1.3664 |
| Intercept | 0.0613 | 0.1334 | -0.139 | -0.733 |
| ecm (-1) | -0.860 | -3.392 | -1.0486 | -3.991 |
| R-squared | 0.52 | | 0.58 | |

Dependent variable: ΔGDI

*Table 5.* **Diagnostic test statistics of ECM,** *authors'*

| | India | | | | Pakistan | | | |
|---|---|---|---|---|---|---|---|---|
| | Serial Correlation | Heteroske-dasticity | ARCH test | Normality test | Serial Correlation | Heterosked-asticity | ARCH test | Normality test |
| Eq. (2) | 0.932 (0.41) | 0.136 (0.71) | 0.652 (0.77) | 1.345 (0.51) | 0.206 (0.82) | 0.067 (0.99) | 1.11 (0.30) | 1.25 (0.53) |
| Eq. (3) | 0.451 (0.34) | 0.273 (0.50) | 0.30 (0.67) | 2.43 (0.29) | 0.714 (0.49) | 0.171 (0.53) | 0.690 (0.45) | 0.64 (0.59) |
| Eq. (4) | 0.524 (0.22) | 0.11 (0.83) | 0.57 (0.47) | 0.43 (0.80) | 0.245 (0.32) | 0.186 (0.75) | 0.670 (0.40) | 0.53 (0.76) |
| Eq. (5) | 0.247 (0.54) | 0.34 (0.60) | 0.39 (0.28) | 0.30 (0.85) | 0.217 (0.80) | 0.473 (0.79) | 0.918 (0.21) | 0.29 (0.86) |

Note: p-values are in parenthesis.

*Table 6.* **Results of causality test based on VECM for India,** *authors'*

| Variable | Short-run results | | | | ECT (t-stats) | Joint short-run and long-run results | | | |
|---|---|---|---|---|---|---|---|---|---|
| | (F-stats) | | | | | (F-stats) | | | |
| | ΔGDI | ΔFDI | ΔGDP | ΔRIR | | ΔGDI& ECT | ΔFDI& ECT | ΔGDP &ECT | ΔRIR& ECT |
| ΔGDI | - | 2.34 | 3.93** | 0.14 | -3.4*** | - | 6.2*** | 7.8*** | 5.7*** |
| ΔFDI | 0.51 | - | 4.25** | 0.27 | -0.80 | 0.56 | - | 4.09** | 0.43 |
| ΔGDP | 3.27* | 3.74** | - | 0.26 | -1.86* | 3.91** | 1.75 | - | 6.34** |
| ΔRIR | 2.55 | 2.85** | 2.57 | - | -1.06 | 0.81 | 0.57 | 0.58 | - |

Note: ***, ** and * indicate the significance at the 1%, 5% and 10% levels respectively.

There is a bidirectional causality between economic growth and domestic investment in the short-run in case of India. Similarly, the bidirectional causal relation in the short-run is witnessed between FDI and economic growth whereas the short-run causality runs from FDI to interest rate and not in the opposite direction. The error correction results revealed for India the deviation from long-run was mainly adjusted by domestic investment and economic growth whereas FDI and real interest rate seem weakly exogenous. This uncovers that any changes in the latter two variables that disturb the long-run equilibrium are corrected by counter-balancing changes in the former two variables. In this context, it can be concluded that domestic invest-

ment and economic growth are caused by FDI and real interest rate, however, the former does not cause these two variables. The value of F-test in domestic investment equation confirming the joint significance of short- and long-run causal relation of domestic investment with FDI, economic growth and real interest rate. This result validated the long run estimates of these variables obtained through cointegration technique. Economic growth is the only variable as compare to domestic investment and real interest rate that had the joint significance of short run and long run causal relation with FDI. This confirmed the weak exogenous position of FDI. In the economic growth equation, the domestic investment and the real rate of interest had this joint causality with economic growth. The real interest rate turned out to be strongly exogenous in the last equation, as all other variables combined with error correction term are statistically insignificant.

The results for causal relationship, based on VECM, between variables are presented in Table 7 for Pakistan. There is a unidirectional causality running from FDI to domestic investment and bidirectional causality between real interest rate and domestic investment. Similarly, two-way causation is witnessed for real interest rate with economic growth and FDI. The long-run causality for domestic investment based on the significance of the error correction term suggested the deviation from the long-run equilibrium was corrected by changes in FDI whereas economic growth and real interest rate found to be weakly exogenous in the case of Pakistan. In the last equation of real interest rate the error correction term posited that the deviation from long run was adjusted through changes taken place in domestic investment, FDI and economic growth in long run. This result contradicted the weak exogeneity of real interest rate. The error correction term is not significant in FDI and economic growth equations.

*Table 7.* **Results of causality test based on VECM for Pakistan,** *authors'*

| Variable | Short-run results (F-stats) | | | | ECT (t-stats) | Joint short-run and long-run results (F-stats) | | | |
|---|---|---|---|---|---|---|---|---|---|
| | ΔGDI | ΔFDI | ΔGDP | ΔRIR | | ΔGDI& ECT | ΔFDI& ECT | ΔGDP &ECT | ΔRIR& ECT |
| ΔGDI | - | 4.56** | 1.34 | 0.99 | -3.9*** | - | 9.7*** | 8.03*** | 8.58*** |
| ΔFDI | 0.69 | - | 0.39 | 0.41 | 0.63 | 0.26 | - | 0.15 | 0.13 |
| ΔGDP | 0.17 | 0.21 | - | 0.25 | 0.46 | 0.32 | 0.31 | - | 0.34 |
| ΔRIR | 5.05** | 4.50** | 5.25** | - | 1.99* | 2.14 | 1.94 | 3.18* | - |

Note: ***, ** and * indicate the significance at the 1%, 5% and 10% levels respectively.

The joint significance of short- and long-run is verified through F-test in the third part of Table 7. This test confirmed that FDI, economic growth and real interest rate had short run causality combined with error correction term for domestic investment equation confirming the long run estimates obtained through cointegration test. FDI and economic growth turned out as exogenous as it can be seen that the F-test is not significant. The endogeneity of real interest rate is affirmed as economic growth has the joint short- and long-run causality with the former.

**Conclusions and recommendations.** The role of FDI as an economic stimulator is doubtful, as its effect on domestic investment is dubious. This dubious nature of the impact of FDI on economic growth through domestic investment varies from country to country. Time series analysis of cointegration and error correction model is

applied to explore the nexus between FDI and domestic investment. This comparative study covers the period from 1978 to 2013 for India and Pakistan. The results documented that FDI had complementary effect on domestic investment in India whereas it had substituted effect on domestic investment in Pakistan in the long-run. This negative effect of FDI in the case of Pakistan can be attributed to many reasons, however, privatization of state-owned enterprises might be the sole reason. Although it has earned the revenue for the government in the short-run, it crowded out domestic investment in the long-run. The inability of domestic firms to compete with foreign firms might be the second reason. Thus, it might be concluded that Indian firms are more competitive than Pakistanis firms. The short-run estimates obtained through VECM is same for India like the long run, whereas for Pakistan, FDI has positive and significant effect on domestic investment. This short-run effect of FDI can be attributed to fact that FDI inflows to Pakistan came in the time when economic situation is favorable for investment and investors had confidence in the economy. However, the inability of domestic investors to compete with foreign investors crowded out them in the long-run. FDI came out weakly exogenous in India and strongly exogenous in Pakistan. Our results confirm that FDI complements (substitutes) domestic investment is country specific scenario. The negative association of interest with domestic investment posited that it hurts domestic investment. There is no evidence of causation from interest to FDI, thus monetary policy did not play any role in attracting FDI to both economies.

For India, current policy regarding FDI is working well so it has to be continued and steps are required to attract more and more FDI. In the case of Pakistan, it is highly recommended that FDI should be attracted and encouraged to invest in primary and secondary industries. It is worth mentioning that privatization of state own enterprises may not be the major source of FDI. Steps are required to set and compel FDI to make vertical linkages with domestic firms, thus technology diffusion and spillover happens so that it complements domestic investment.

### References:

*Acar, S., Eris, B., Tekce, M.* (2003). The Effect of Foreign Direct Investment on Domestic Investment: Evidence from MENA Countries. World Investment Report 2003, UNCTAD, New York and Geneve.

*Agosin, R.M., Machado, R.* (2005). Foreign Investment in Developing Countries: Does it Crowd in Domestic Investment? Oxford Development Studies, 33(2): 149–162.

*Agosin, R.M., Mayer, R.* (2000). Foreign Investment in Developing Countries: "Does It Crowd in Domestic Investment? Discussion Paper No. 146. Geneva: United Nations Conference on Trade and Development.

*Al-Sadig, A.J.* (2013). Outward Foreign Direct Investment and Domestic Investment: The Case of Developing Countries. IMF working paper: Middle East and Central Asia Department, WP/13/52.

*Arndt, C., Buch, C.M., Schnitzer, M.E.* (2007). FDI and Domestic Investment: An Industry Level View. Governance and the Efficiency of the Economic Systems Discussion Paper No. 212.

*Eregha, P.B.* (2011). The Dynamic Linkages between Foreign Direct Investment and Domestic Investment in ECOWAS Countries: A Panel Cointegration Analysis. Paper Presented at the 2011 Conference of the Centre for the Study of African Economies, Oxford University, Oxford, UK between 20th – 22nd March.

*Gallagher, K.P., Zarsky, L.* (2007). The Enclave Economy: Foreign Investment and Sustainable Development in Mexico's Silicon Valley. The MIT Press, Massachusetts.

*Harrison, A.E., McMillan, M.S.* (2003). Does Direct Foreign Investment Affect Firms. Credit Constraints? Journal of International Economics, 61(1): 73–100.

*Kim, D.D., Seo, J.* (2003). Does FDI inflow crowd out domestic investment in Korea? Journal of Economic Studies, 30(6): 605–622.

*Lin, H.L., Chuang, W.B.* (2007). FDI and domestic investment in Taiwan: an endogenous switching model. The Developing Economies, 45(4): 465–490.

*Misun, J., Tomsik, V.* (2002). Does Foreign Direct Investment Crowd in or Crowd out Domestic Investment? Eastern European Economics, 40(2): 38–56.

*Morrissey, O., Udomkerdmongkol, M.* (2012). Governance, Private Investment and Foreign Direct Investment in Developing Countries. World Development, 40(3): 437–445.

*Ndikumana, L., Verick, S.* (2008). The Linkages between FDI and Domestic Investment: Unraveling the Developmental Impact of Foreign Investment in Sub-Saharan Africa. Germany. Institute for the Study of Labor (IZA). Working Paper No. IZA DP No. 3296.

*Saglam, B.B., Yalta, A.Y.* (2011). Dynamic Linkages among FDI, Public and Private Investment in Turkey. Applied Econometrics and International Development, 11(2): 70–82.

*Tang, S., Selvanathan, E.A., Selvanathan, S.* (2008). Foreign Direct Investment, Domestic Investment, and Economic Growth in China: A Time Series Analysis. UNU-WIDER Research Paper No. 2008/19.

*Wang, M.* (2010). Foreign direct investment and domestic investment in the host country: evidence from panel study. Applied Economics, 42(29): 3711–3721.

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